

**REMARKS****Rejection of Claims and Traversal Thereof**

In the February 4, 2008 Office Action:

claims 31, 34-40 and 48 were rejected under 35 U.S.C. §112, second paragraph;

claim 48 was rejected under 35 U.S.C. §112, first paragraph;

claims 27, 28, 30-37, 38, 40 and 48 were rejected under 35 U.S.C. §102(b) as being anticipated by Chapman et al (US Patent No. 6,232,099, hereinafter Chapman);

claims 29 and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Chapman and in further view of Harris, et al. (International Immunology, 1997, Vol 9, p 273-280).

These rejections are hereby traversed and reconsideration of the patentability of the pending claims is therefore requested in light of the following remarks.

**Rejection under 35 U.S.C. §112, second paragraph**

Claims 31, 34-40 and 48 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. Applicants have amended the claims thereby obviating this rejection. Applicants request the withdrawal of this rejection.

**Rejection under 35 U.S.C. §112, first paragraph**

Claim 48 was rejected under 35 U.S.C. §112, first paragraph as failing to comply with the enablement requirement. According to the Office, the claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make, and/or use the invention. Applicants vigorously disagree.

According to the Office, the term “vaccine” implies any preparation intended for active immunological prophylaxis and then further states that “prophylaxis” means the prevention of a disease. The Office

further discusses the problems of preventing HIV. It should be noted that applicants did not use the term "prevent" and are well aware that a vaccine for many viruses, including HIV, does not necessary prevent the disease but instead helps to treat the disease or keep it from taking over the entire T cell population.

Applicants' invention relates to the inducing of antibody production and the Office has not provided any explanation why one of skill in the art would not be able to make and use the invention without undue experimentation. Applicants remind the Office that some experimentation is acceptable as long as it is not undue. In *PPG Indus., Inc., v. Guardian Indus. Corp.*, 27 USPQ2d 1618, 1623 (Fed. Cir. 1996), the court stated that even where some experimentation is necessary to reduce an invention to practice, the enablement requirement is satisfied where: (1) the experimentation is routine; or (2) the specification provides "a reasonable amount of guidance with respect to the direction in which the experimentation should proceed to enable the determination of how to practice a desired embodiment of the claimed invention." Applicants' specification meets these requirements.

The present specification provides instructions for all the steps required for producing the VLPs of the present invention, as the Office has already stated. Regarding for testing of an immune response, such assays are well known to those skilled in the art. Thus, the disclosure is sufficient to enable those skilled in the art to practice the claimed invention. Further, it is well settled in the law that a specification need not disclose what is well known in the art. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481 (Fed. Cir. 1984). It has been consistently held by the courts that the first paragraph of 35 USC §112 requires nothing more than objective enablement. In satisfying the enablement requirement, an application need not teach, and preferably omits, that which is well-known in the art. Clearly if every last detail needed to be described, a patent specifications would turn into dissertation, which they were never intended to be. Thus the fact that one skilled in the art can easily determine if the VLPs induce an immune response, such examples are not required in the present specification.

Applicants submit that the instant application provides sufficient and enabling information for a person of ordinary skill in the art to practice applicants' invention and respectfully request the withdrawal of all rejections under §112, first paragraph.

**Rejection under 35 U.S.C. §102(b)**

Claims 27, 28, 30-37, 38, 40 and 48 were rejected under 35 U.S.C. §102(b) as being anticipated by Chapman. Applicants insist that Chapman is not an anticipatory reference and does not defeat the patentability of the claimed invention.

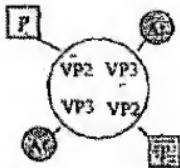
Applicants' amended claim 27 recites:

A method of producing a recombinant virus-like particle that targets specific tissue in a target animal, the method comprising:

- (a) providing a viral genome;
- (b) isolating viral coat protein sequences that encode for a capsid structure;
- (c) inserting at least one first exogenous sequence encoding a protein or peptide of interest into the coat protein sequences;
- (d) inserting at least one second exogenous sequence encoding a tissue-targeting protein sequence into the coat protein sequences;
- (e) cloning the viral coat protein sequences comprising the first and second exogenous sequences into an appropriate vector; and
- (f) transforming a yeast, bacterial or algae host organism for expression of the recombinant virus-like particle.

Anticipation under 35 U.S.C. § 102 requires the presence in a single reference of each and every element of the claimed invention, **arranged as in the claim**. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added)

Figure 1 of the present application, recreated below for ease of discussion, shows the elements of applicants' invention, wherein capsid proteins are recombinantly modified to include sequences that express antigenic or allergenic proteins (A) along with a tissue-targeting protein (P) that are displayed on the capsid proteins. Importantly the tissue-targeting protein helps target the antigen to the cell surface, such as intestinal mucosa. Thus, the present invention provides for three separate and distinct expressed components, the capsid proteins, the antigen and the tissue target protein.



Applicants insist that the Chapman reference does not in any way disclose, teach or suggest the presently claimed invention. Applicants have reviewed the entire Chapman reference and there is no disclosure relating to the use of a tissue-targeting protein, such as found in the present invention. The Office is mistaken when stating that the use of the word "target protein" is a protein that has a "function to target the VLP to a specific location." There is no disclosure for this function in Chapman and the use of the term "target protein" in claims 1, 19, 25, 29 or 33 does not relate to targeting the VLP to specific tissue.

Chapman teaches a polynucleotide encoding a chimeric protein having a **first** (viral) portion and a **second** (non-viral) portion, the chimeric protein being capable of assembly into a virus particle (first viral portion) such that the second portion is disposed on the exterior surface of the assembled virus particle. Chapman describes the first and second portion in column 4, and recreated below.

The first (viral) portion of the chimeric protein may be any protein, polypeptide or parts thereof, derived from a viral source including any genetically modified versions thereof (such as deletions, insertions, amino acid replacements and the like). In certain embodiments the first portion will be derived from a viral coat protein (or a genetically modified version thereof). Mention may be made of the coat protein of Potato Virus X as being suitable for this purpose. Preferably the first portion has the ability to aggregate into particles by first-portion-first portion association. Thus, a chimeric protein molecule can assemble with other chimeric protein molecules or with wild-type coat protein into a chimeric virus.

In a preferred embodiment of the invention the particle is derived from a polyvirus or even more preferably a poxvirus such as PVX, and in such an embodiment, the second portion is preferably disposed at or adjacent the N-terminus of the coat protein. In PVX, the N-terminus of the coat protein is believed to form a domain on the outside of the virion.

The second portion of the chimeric protein may be any protein, polypeptide or parts thereof, including any genetically modified versions thereof (such as deletions, insertions, amino acid replacements and the like) derived from a source other than the virus from which the first portion is derived. In certain embodiments the second portion or the protein derived therefrom is a biologically active or useful molecule. The second portion or the protein derived therefrom may also be a diagnostic reagent, an antibiotic or a therapeutic or pharmaceutically active agent. Alternatively the second portion or the protein derived therefrom may be a food supplement.

It is very evident that Chapman describes only two portions, the first being the virus particle that provides a surface and the second which is a biologically active protein displayed on the surface. Clearly, there is no disclosure for a third component that includes a tissue-targeting component such as described in applicants' claimed invention. Thus, Chapman does not anticipate the presently claimed invention and applicants request that this rejection under section 102 be withdrawn.

**Rejection under 35 U.S.C. §103(a)**

Claims 29 and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Chapman and in further view of Harris. Applicants insist that the proposed combination does not in any way render the presently claimed invention as obvious.

Clearly, the Chapman reference does not in any way disclose, teach or suggest all the claimed elements of the presently claimed invention and the addition of Harris does not rectify such shortcomings especially because the Office has already admitted that Harris is only used to teach that an allergen can be positioned on a virus particle.

As such, the proposed combination of Chapman and Harris does not disclose, teach or suggest the following limitations:

1. the capsid proteins that form a virus capsid structure;
2. an antigen or allergen proteins displayed in the capsid structure; and
3. a tissue target protein having affinity for specific tissue for placing the antigen in the vicinity of the tissue for effecting a response by the antigen.

Even in light of the *KSR* decision the Office is still required to present a *prima facie* case of obviousness, which clearly has not been established by the proposed combination because each and every element of the presently claimed invention has not been shown in the proposed combination

Applicants are aware that the Office will next attempt to find another reference to combine with Chapman and Harris in an attempt to meet the requirements of obviousness. However, it is recognized by applicants that the Office would not be able to locate such a component without using applicants' specification as a blueprint to piece together the different parts. It is should be noted that simply retracing

the path of the inventor with hindsight is impermissible and does not meet the standards required to establish a *prima facie* case of obviousness.

In light of the above discussion, applicants submit that the Office has not established a *prima facie* case of obviousness, and as such, applicants request that the rejection under 35 U.S.C. §103(a) be withdrawn.

**Fees payable**

It is believed that no fees are due at this time. However, if a fee is found due, the Commissioner is hereby authorized to charge any deficiencies, or reimburse any over-charges, to Deposit Account No. 13-4365 of Moore & Van Allen, PLLC.

**New Power of Attorney and Change of Correspondence Address**

Applicants filed an executed Power of Attorney form on February 5, 2008 that revoked the previously filed Power of Attorney and appointed new representation with a new Attorney Docket Number **014835-037.21US**. Further, applicants requested a Change of Correspondence, so that all communications from the USPTO will be sent to the following contact and address:

**Marianne Fuirer  
Moore & Van Allen, PLLC  
P. O. Box 13706  
Research Triangle Park, NC 27709**

Applicants are requesting that this change of addressed be recognized.

**Conclusion**

Applicants have satisfied the requirements for patentability. All pending claims are free of the art and fully comply with the requirements of 35 U.S.C. §112. It therefore is requested that Examiner Boesen reconsider the patentability of the pending in light of the distinguishing remarks herein, and withdraw all rejections, thereby placing the application in condition for allowance. Notice of the same is earnestly solicited. In the event that any issues remain, Examiner Boesen is requested to contact the undersigned attorney at (919) 286-8089 to resolve same.

Respectfully submitted,



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